

## Gout

### Introduction

Gout is an inflammation of the joints. People with gout have intense pain and swelling in their joints. If not treated, gout attacks can become increasingly frequent and painful. With proper treatment, gout can be stopped from getting worse and the pain can be managed.

This reference summary explains how gout occurs, its treatment options, and some tips for preventing it.

### Joints & Arthritis

The human body has 206 bones that give it shape and strength. The place where 2 bones meet is called a joint. At the joints, the bones are covered by tissue called cartilage.

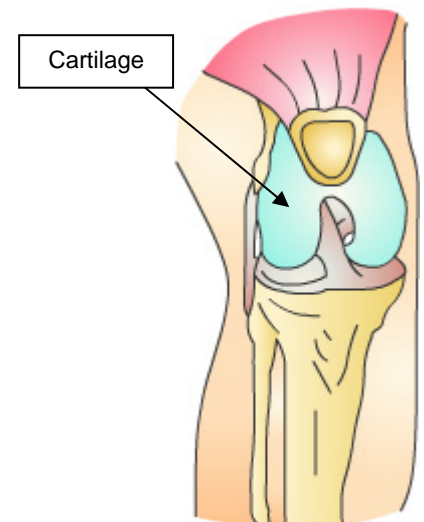
Joints have a clear fluid in them called synovial fluid. This fluid lubricates the joint, just like oil lubricates the engine of a car. The synovial fluid allows the joint to move smoothly with very little friction.

When the tissues of a joint are injured or affected by a disease, they may swell and become red and hot, causing pain. This is known as joint inflammation, or arthritis. There are more than 100 different types of arthritis. Gout is a type of arthritis; it affects 1 out of every 20 patients who have arthritis.

Gout results from crystals of a substance called uric acid that deposit in the joints. The next section explains what uric acid is and how it causes gout.

### Causes

Purine is a chemical compound that is in all the cells of the body. As cells divide and multiply, the body continually breaks down purine and reuses its components to make



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new cells. Extra purine is secreted out of the body in the urine in the form of uric acid, another chemical compound. At times, there may be abnormally high levels of uric acid in the blood. This condition is called “hyperuricemia.”

When there is a lot of uric acid in the body, it will form crystals. This is similar to what happens with salt as it is poured into a cup of water. If salt is poured into a cup of water, first the salt dissolves and cannot be seen. But, if more salt is added, salt crystals can be seen forming and falling to the bottom of the cup.

Under a microscope, crystals of uric acid are sharp and pointy and look like little needles. In some people, uric acid crystals deposit in the joints. Uric acid crystals may also deposit under the skin, forming a lump that can sometimes be felt on the outside of the body. This is called a “tophus.”

The immune system, the body’s defense against sickness, realizes that the crystals should not be there and starts attacking them. This is what causes joint pain, swelling, and tenderness when a person has gout. Extra uric acid may also deposit in the kidneys and cause kidney stones.



## **Risk Factors**

Some people have more risk than others of developing high levels of uric acid, which leads to gout. Inherited diseases can cause high levels of uric acid; 6-18% of patients with gout have a family history. Eating too many foods that are rich in purine can cause the body to produce more uric acid. Foods that have a lot of purine include shellfish and organ meats, such as liver, kidney, and brain. Dried beans, peas and anchovies are also high in purines.

Drinking too much alcohol interferes with the body’s ability to get rid of extra uric acid and causes higher levels in the blood stream. Exposure to high levels of lead tends to increase the levels of uric acid in the blood. Being overweight increases the risk of developing gout. Some medications increase the risk of hyperuricemia, or high levels of uric acid.

Water pills, called diuretics, interfere with the kidneys' ability to excrete uric acid from the blood. This causes higher levels of uric acid in the blood. Diuretics are given to patients to treat high blood pressure and heart disease.

Other medications, such as levodopa, which are given to patients with Parkinson's disease, and salicylates such as aspirin, can also increase the levels of uric acid in the blood.

Patients who are on cyclosporine are at a higher risk of developing gout. Cyclosporine is a medication typically given to patients who have received an organ transplant to prevent rejection.



## Symptoms & Stages

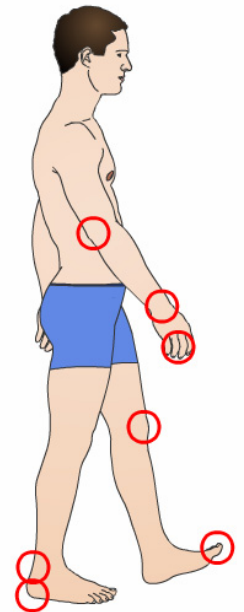
Gout affects about 275 out of every 100,000 people. Men are slightly more likely to be affected by it than women. The first symptoms of gout are usually noticed in the early 40s. High levels of uric acid *alone* usually do not produce symptoms.

The symptoms of gout start when uric acid crystals begin depositing in the tissues of the body: under the skin, in the joints, and in the kidneys. In many gout patients, the first symptom is pain, redness, swelling, and tenderness in the big toe. This condition is called "podagra." At one point or another, podagra affects 3 out of every 4 patients who have gout.

Joints that are frequently affected by gout include:

- ankle
- heels
- knees
- wrists
- fingers
- elbow

Attacks of inflammation in the joints due to gout usually last for a few days and improve on their own. As times goes by, gout attacks may become more frequent and may last longer, requiring treatment.



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If gout is not treated, it can become disabling and crippling. However, most patients do not reach this stage because it is typically discovered and treated early. This last stage is known as tophaceous gout. The joints can be permanently damaged and similarly the kidneys can also be irreversibly affected.

## Diagnosis

After taking a detailed medical history and doing a thorough physical examination, the doctor may request a blood sample to check the level of uric acid in your blood. If a joint is inflamed when you are at the doctor's office, the doctor may withdraw some fluid from the joint. This is under local anesthesia. The sample is sent to a pathologist to examine it under a microscope.

If the pathologist sees no crystals in the joint fluid, the doctor may surgically take out one of the tophi or lumps, found under the skin and have it tested by a pathologist to check for uric acid crystals.

X-rays sometimes show deposits of uric acid crystals and any bone damage resulting from repeated inflammations.

It is important to note that most people with hyperuricemia do NOT develop the arthritis symptoms of gout, such as swelling, redness, pain, and tenderness.



Bone Damage

During an acute attack, the uric acid levels in the blood are not always elevated. That is why it is necessary to aspirate an affected joint, or take a small piece of tophus out surgically to be examined by a pathologist.

## Treatment

Gout is treated with medications that

- Relieve the pain of gout attacks
- Decrease joint inflammation
- Decrease the level of uric acid in the blood

Doctors recommend acetaminophen, such as Tylenol®, to relieve gout pain. Aspirin should be avoided for gout pain because it can prevent the kidneys from excreting uric acid. If gout pain is severe, your doctor can prescribe more powerful pain relief medicine.

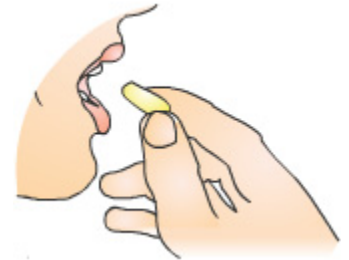
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There are many goals for the treatment of gout. The most important goal is to control the severe pain of gout attacks. Treatment of gout also aims at preventing more attacks, and preventing the formation of new tophi and kidney stones.

Medications called non-steroidal anti-inflammatory drugs (NSAIDs) work to treat acute gout. Common side effects of NSAIDs include:

- Irritation of the gastrointestinal system
- Ulcers in the stomach and intestines
- Intestinal bleeding
- Severe allergic reaction



If the patient's stomach and intestines are sensitive to NSAIDs, corticosteroids can be prescribed to treat acute gout. Colchicine is another medication that is very effective in decreasing the swelling and pain and aborting an episode. This medication is more effective if taken in the first 12 hours of the onset of the attack.

Medication that lowers the levels of uric acid in the blood may also be prescribed to treat gout. These include allopurinol, febuxostat (Uloric®) or probenecid.

## Preventing Gout

Taking steps to *prevent* gout attacks is as important as taking medication to treat it. The following are 5 tips for preventing gout.

- Drink a lot of water and fluids. This helps to flush out uric acid and keeps it from depositing in the tissues.
- Reduce weight by eating a little less and getting exercise. Do this under the supervision of a doctor because a very rapid loss of weight could worsen gout!
- Avoid eating food that is high in purines, such as shellfish and organ meats like liver, brain, and kidney.
- If you drink alcohol, make sure you do not drink too much.
- Take medication to reduce the level of uric acid in your blood.



During a gout attack, resting and elevating the inflamed joint can relieve the pain. Applying an ice pack to the inflamed joint helps to reduce the pain also.

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## Summary

Gout is one of the most painful rheumatic diseases. If not treated promptly, gout can lead to painful attacks and can even cause disability and kidney stones.

Making dietary changes is as important as taking the prescribed medication for preventing gout. Thanks to recent advances in medicine, treating gout and stopping its progress are possible and usually successful.



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